

PRELIMINARY AMENDMENT
Divisional of
U.S. Appln. No. 09/837,764

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.-23. (Cancelled).

24. (Original): A photographing method in which:

employing a photographing element for sequentially transferring and reading out the charge stored on each light receiving pixel, a light-image of a subject is focused on the light-receiving zone of said photographing element, and

said assembled light image is photoelectrically converted at and stored as a signal charge on each light-receiving pixel within said light-receiving zone, and

said stored signal charge is converted to an image signal and read out, wherein

said light-image is focused on a readout zone formed from less than the total number of pixels within the light-receiving zone, and

the readout signal charge transferred to and stored on the light-receiving pixels contained in said light-receiving zone is read out as said image signal and the residual signal charge transferred to and stored on the light-receiving pixels in the non-readout zone outside the readout zone is read out as empty.

25. (Original): A photographing method as defined in claim 24, wherein said sequentially transferred signal charge is subjected to binning processing before said readout signal charge is read out.

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26. (Original): A photographing method in which:

employing a photographing element for sequentially transferring and reading out the charge stored on each light-receiving pixel, a light-image of a subject is focused on the light-receiving zone of said photographing element, and

said assembled light image is photoelectrically converted at and stored as a signal charge on each light-receiving pixel within said light-receiving zone, and

said stored signal charge is converted to an image signal and read out, wherein

said light-image is focused on a readout zone formed from less than the total number of pixels within the light-receiving zone, and

the readout signal charge transferred to and stored on the pixels contained in said light-receiving zone is read out as said image signal and the residual signal charge transferred to and stored on the light-receiving pixels in the non-readout zone outside the readout zone is discarded via a clearing drain.

27. (Original): A photographing method in which:

employing a photographing element capable of reading out in a random manner the charge stored on each pixel, a light-image of a subject is focused on the light-receiving zone of said photographing element, and

said assembled light image is photoelectrically converted at and stored as a signal charge on each light-receiving pixel within said light-receiving zone, and

said stored signal charge is converted to an image signal and read out, wherein

said light-image is focused on a readout zone formed from less than the total number of

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pixels within the light-receiving zone, and

the readout signal charge transferred to and stored on the pixels contained in said light-receiving zone is read out as said image signal and the residual signal charge transferred to and stored on the light-receiving pixels in the non-readout zone outside the readout zone or said residual signal charge grouped together with the signal charge stored on the light-received pixels contained in said light-receiving zone after said readout signal charge has been read out are read out as empty for each block or one pixel at a time.

28. (Original): A photographing apparatus comprising a photographing element, an image focusing means for focusing a light-image of a subject within the light-receiving zone of said photographing element, said photographing element comprising a photoelectric conversion portion for photoelectrically converting at each light-receiving pixel within said light-receiving zone the light received thereon to a signal charge and storing said signal charge on each of said pixels, a charge transfer portion for sequentially transferring the signal charge stored on each of said light-receiving pixels, and a readout portion for converting said sequentially transferred signal charge to an electric image signal and reading out said image signal, wherein

said light-image is focused on a readout zone formed from less than the total number of pixels within the light-receiving zone, and

further comprising a sequential-readout control means for controlling the reading out, by the sequential-readout portion, of the readout signal charge stored on the light-receiving pixels of said readout zone as an image signal and the reading out, by said sequential-readout portion, as empty of the residual signal charge stored on the light-receiving pixels of the non-readout zone

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outside said readout zone.

29. (Original): A photographing apparatus as defined in claim 28, further comprising a gate provided between said charge conversion portion and said sequential-readout portion for controlling passage of the signal charge from said charge conversion portion to said sequential-readout portion, and a gate control means for controlling said gate so as to facilitate the subjecting of said readout signal charge to binning processing before said readout signal charge is transferred by said charge conversion portion and read out by said sequential-readout portion.

30. (Original): A photographing apparatus comprising a photographing element, an image focusing means for focusing a light-image of a subject within the light-receiving zone of said photographing element, said photographing element comprising a photoelectric conversion portion for photoelectrically converting at each light-receiving pixel within said light-receiving zone the light received thereon to a signal charge and storing said signal charge on each of said light-receiving pixels, a charge transfer portion for sequentially transferring the signal charge stored on each of said light-receiving pixels, and a readout portion for converting said sequentially transferred signal charge to an electric image signal and reading out said image signal, wherein

said light-image is focused on a readout zone formed from less than the total number of pixels within the light-receiving zone, and

further comprising a clearing drain for discarding the signal charge sequentially transferred by said charge converting portion, and a sequential-readout control means for

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controlling the reading out, by said sequential-readout portion, of the readout signal charge stored on the light-receiving pixels of said readout zone, and the discarding of the residual signal charge stored on the light-receiving pixels of the non-readout zone outside the readout zone into said clearing drain.

31. (Original): A photographing apparatus as defined in claim 30, further comprising a first gate provided between said charge transfer portion and said sequential-readout portion for controlling passage of the signal charge from said charge transfer portion to the sequential-readout portion, a second gate provided between said charge transfer portion and said clearing drain for controlling passage of the signal charge from the charge transfer portion to the clearing drain, and a gate control means for controlling gate 1 and gate 2 so as to facilitate the subjecting of said readout signal charge to binning processing before said readout signal charge is transferred by said charge conversion portion and read out by said sequential-readout portion.

32. (Original): A photographing apparatus comprising a photographing element, an image focusing means for focusing a light-image of a subject within the light-receiving zone of said photographing element, said photographing element comprising a photoelectric conversion portion for photoelectrically converting at each light-receiving pixel within said light-receiving zone the light received thereon to a signal charge and storing said signal charge on each of said light-receiving pixels, a pixel selecting means capable of randomly selecting pixels from among said light-receiving pixels, and a random readout portion for converting the signal charge of said selected light-receiving pixels to an electric image signal and reading out said image signal in a random manner, wherein

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said light-image is focused on a readout zone formed from less than the total number of pixels within the light-receiving zone, and

a random-readout control means for controlling said pixel selecting portion and said random readout portion so that the light-receiving pixels of said readout zone are selected by said pixel selecting means, and after the readout signal charge stored on said selected light-receiving pixels is read out by said random readout portion, the residual signal charge stored on the light-receiving pixels contained in the non-readout zone outside the readout zone, or said residual signal charge grouped together with the signal charge stored on the light-receiving pixels contained in said readout zone after readout of the readout signal charge are read out from said random readout portion as empty for each block or one pixel at a time.

33. (Original): A photographing apparatus as defined in claim 32, wherein said readout signal charge is subjected to binning processing so that a plurality of light-receiving pixels within said readout zone is simultaneously selected by said pixel selecting means, and the multiplied signal charge of each readout signal charge stored on said plurality of selected light-receiving pixels is converted to an electric image signal and read out by said random reading portion.

34. (Original): A photographing apparatus as defined in claim 26, 27, 28, 29, 30, 31, 32 or 33, wherein

said image focusing means is provided with a zooming optical system, and by use of said zooming optical system is capable of changing the size of the light image assembled within the light-receiving zone.

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35.-39. (Cancelled).

40. (Original): A photographing method as defined in claim 24, 25, 26, 27 or 28, wherein the photographing element is a charge-amplifier type photographing element for amplifying the charge by impact ionization.

41. (Cancelled).

42. (Original): A photographing apparatus as defined in claim 29, 30, 31, 32 or 33, wherein the photographing element is a charge-amplifier type photographing element for amplifying the charge by impact ionization.